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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,541	10/16/2003	David A. Morgenstern	MTC 6888.2(40-21(52925)C)	7748
321 7590 08/06/2008 SENNIGER POWERS LLP ONE METROPOLITAN SQUARE 16TH FLOOR ST LOUIS, MO 63102			EXAMINER ECHELMEYER, ALIX ELIZABETH	
			ART UNIT 1795	PAPER NUMBER
			NOTIFICATION DATE 08/06/2008	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

uspatents@senniger.com

### Office Action Summary

**Application No.**

10/687,541

**Applicant(s)**

MORGENSTERN, DAVID A.

**Examiner**

Alix Elizabeth Echelmeyer

**Art Unit**

1795

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 May 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-63 and 65-130 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-63 and 65-130 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/S5108)  
Paper No(s)/Mail Date 5/5/08
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 5, 2008 has been entered.
2. No claims have been amended. Claims 1-63 and 65-130 are pending. Claims 53-63, 65-87 and 109-116 were previously withdrawn. Claims 1-52, 88-108 and 117-130 are rejected for the reasons given below.

### ***Claim Interpretation***

3. The product-by-process limitations of claims 1, 4-6, 9-11, 33-35, 39-41, 88-90, 101, 106-108, 117-119 and 127 are not given patentable weight since the courts have held that patentability is based on a product itself, even if the prior art product is made by a different process (see In re Thorpe, 227 USPQ 964, (CAFC 1985), In re Brown, 173 USPQ 685 (CCPA 1972), and In re Marosi, 218 USPQ 289, 292-293 (CAFC 1983)).

Claims 1, 88-90, 101, 106-108, 117-119 and 127 are drawn to methods for forming the catalyst. While the claims are process claims, the process of those claims is

that of reforming a feed gas to produce hydrogen, and not the process of forming the catalyst.

Additionally, claims 4-6, 9-11, 33-35 and 39-41 are drawn to the method by which the surface area is measured, specifically the Brunauer-Emmett-Teller method. That method is not given patentable weight since the surface area limitations are met.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-3, 22-25, 95, 98, 101, 105-108, 117-119, 121, 124 and 127 are rejected under 35 U.S.C. 102(b) as being anticipated by de Wild et al. (de Wild, P.J. and M.J.F.M. Verhaak, Catalytic production of hydrogen from methanol, Catalysis Today 60 (2000) 3-10).

Regarding claims 1-3, 101, 105-108, 117-119, 121 and 127, de Wild et al. teach steam reforming of methanol as a feed gas to produce hydrogen for use in fuel cells (abstract). The reforming catalyst is copper on an aluminum foam substrate (page 5, 1st column, 2nd paragraph). As discussed above, the product by process limitations to how the catalyst is made are not given patentable weight.

As for claims 22-24, de Wild et al. teach that the reformation process takes place in the temperature range of about 125-290 °C (Figure 3).

As for 25, the catalyst substrate may be a pellet (page 5, 1st column, 2nd paragraph).

Regarding claims 95, 98 and 124, since the fuel feed gas, temperature, and catalyst are the same as those of the instant invention, methane would inherently be in the product mixture.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 27, 28, 32, 38, 51, 88-90, 94, 122 and 123 are rejected under 35 U.S.C. 103(a) as being unpatentable over de Wild et al.

The teachings of de Wild et al. as discussed above are incorporated herein.

De Wild et al. teach reforming of methanol as the fuel gas but fail to teach ethanol.

De Wild et al. teach that it is known in the art to use ethanol in reformation reactions to form hydrogen for use in fuel cells (page 1, column 1).

As for claims 28 and 123, de Wild et al. teach that the reformation process takes place in the temperature range of about 125-290 °C (Figure 3).

As for claims 38 and 51, the catalyst is discussed above.

Claims 88-90 contain product by process limitations that are not given patentable weight, see above.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use ethanol instead of methanol in the reforming reaction if, for example, ethanol was more readily available than methanol, since it is known in the art to use ethanol as well as methanol in reformation reactions of a gas fuel.

8. Claims 7, 8, 12-21, 26, 29-31, 36, 37, 42-50, 52, 91-93, 102-104, 120 and 128-130 are rejected under 35 U.S.C. 103(a) as being unpatentable over de Wild et al. as applied above, and further in view of Sargent (US 2,892,801).

The teachings of de Wild et al. as discussed above are incorporated herein.

De Wild et al. teach reforming of methanol as a fuel gas to produce hydrogen for use in fuel cells but fail to teach that the metal supporting structure is nickel.

Sargent teaches a catalyst made of a copper-plated nickel sponge (column 1 lines 40-44). Sargent further teaches that the catalyst may be used in dehydrogenation (column 4 lines 44-47).

As for claims 7, 8, 12, 15, 16, 36, 37, 45 and 46, Sargent teaches that the final catalyst may be from 0.5 percent to 75 percent by weight copper (column 2 lines 21-24). Specific examples 5 and 6 on columns 3 and 4 teach that the catalyst may be as much as 27.0 or 44.4 percent by weight copper.

Regarding claims 13, 14, 43 and 44, Example 1 of Sargent teaches a catalyst of 9.5 percent by weight copper (column 3). This would yield a catalyst of 90.5 percent by weight nickel.

With regard to claims 17-19 and 47-49, since the catalyst structure, including the amount and surface area of the components, is identical to the presently claimed invention, the amount of nickel at the surface of the catalyst would inherently be the same in the combination of Marino et al. and Sargent as in the instantly claimed invention.

With regard to claims 29-31, since the catalyst structure, including the amount and surface area of the components, is identical to the presently claimed invention, the thermal conductivity of the catalyst would inherently be the same in the combination of Marino et al. and Sargent as in the instantly claimed invention.

Sargent teaches that such a catalyst has high activity (column 1 lines 40-43).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the catalyst of Sargent for the reformation reaction of de Wild et al. since it has high activity.

9. Claims 4-6, 9-11, 33-35 and 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over de Wild et al. as applied to claims 1 and 27 above, and further in view of Marino et al.

The teachings of de Wild et al. as discussed above are incorporated herein.

De Wild et al. fail to teach the surface area of copper for the catalyst.

Marino et al. teach a catalyst made of copper on the surface of a substrate for reforming of alcohol in the gas phase to produce hydrogen (abstract; p. 1095 2<sup>nd</sup> column).

Marino et al. teach that the surface area of copper in the catalyst may be 98.80 m<sup>2</sup>/g (Table 4, p. 1099). It is the position of the examiner that 98.80 is about 80. As for the method by which the surface area is measured, as discussed above, the method by which the surface area is measured is not given patentable weight since the surface area limitations are met.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the surface area taught by Marino et al. in the catalyst of de Wild et al. since de Wild et al. does not provide indication of the surface area but one of ordinary skill in the art would recognize that surface area of the catalytic material is important to ensure that the reaction occurs at the desired rate.

10. Claims 96, 97, 99, 100, 125 and 126 are rejected under 35 U.S.C. 103(a) as being unpatentable over de Wild et al. as applied above, and further in view of Henkel et al. (US 4,086,877).

de Wild et al. fail to teach the use of the hydrogen produced in a combustion engine.

Henkel et al. teach the use of a fuel gas containing hydrogen made by a reforming reaction in an internal combustion engine (abstract).



It would have been obvious to use the hydrogen made in the process taught by de Wild et al. for an internal combustion engine such as taught by Henkel et al. since the use of gaseous fuel as opposed to liquid fuel leads to more complete combustion (column 1 lines 11-16).

### ***Response to Arguments***

11. Applicant's arguments, see Remarks, filed May 5, 2008, with respect to the rejection of the claims under Marino et al. in view of Sargent have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground of rejection is made, see above.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alix Elizabeth Echelmeyer whose telephone number is (571)272-1101. The examiner can normally be reached on Mon-Fri 8-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy N. Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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